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Industry and sustainable development*

Report of the Secretary-General

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I. Introduction

1. Industry and its impact on economic and social development and the environment has been at the centre of the debate on sustainable development since the term "sustainable development" was brought into common use by the Brundtland Commission in 1987. There is now a consensus among policy makers that in order to achieve sustainable development, Governments and non-state actors need to make greater efforts to integrate economic, social and environmental goals into industrial policy and decision-making.

2. Section II will describe industry's role in promoting economic growth and the structural transformation of economies. Section III will then show how social development is affected by industry, in particular through its impact on employment generation and poverty alleviation. Finally, Section IV will discuss the impact of industrial activities on the environment and the policy challenges facing Governments, industry and civil society.

3. It is hoped that focusing on the relationship between industry and sustainable development will add value to the outcome of previous sessions of the Commission for Sustainable Development in various ways. First, many issues previously discussed under the headings of a variety of chapters of Agenda 21 will be addressed with a greater emphasis on industry than before, including such sub-sectors as iron and steel, pulp and paper, cement and chemicals. Second, some complementarities and conflicts between economic, social and environmental goals of sustainable development will be revisited. Third, the main national and international policy challenges with respect to industry as a result of recent international events, such as the special session of the General Assembly to review the implementation of Agenda 21 (1997), the World Summit for Social Development (1995), the Fourth World Conference on Women (1995) and the completion of the Uruguay Round of multilateral trade negotiations (1994) will be addressed. Fourth, the effectiveness of a number of recent national and international policy changes in promoting sustainable development will be assessed. Fifth, the involvement of industry in policy formulation and standard setting, both at the national and international levels, will be discussed. Finally, industry's support of sustainable development goals through voluntary measures will be assessed.

II. Industry and economic development

A. Role of industry in development strategies

4. Sustainable industrial policy is at the heart of development strategies, and encompasses a variety of interrelated economic, social and environmental objectives, such as (a) the encouragement of an open, competitive economy through the adoption of appropriate industrial and trade policies, including the progressive liberalization of international and regional trade, within a stable enabling economic and social environment; (b) the creation of productive employment, particularly long-term employment, in order to provide sustained increases in household income and social development; and (c) protection of the natural environment through the efficient use of renewable and non-renewable resources.

5. Industry plays a crucial role in technological innovations and research and development activities that are crucial for economic and social development of any country. In the countries of the European Union (EU), for example, industry provides more than 50 per cent of the total national financial resources for research and development activities, and its share in gross domestic expenditures on those activities is more than 60 per cent. Consequently, industry plays a major role in the development and diffusion of environmentally friendly technologies which constitute a key element of sustainable development.

6. In response to the development strategies that countries have pursued over the years and various other changes (consumption patterns, technological progress, international division of labour and the role of transnational corporations (TNCs)), significant shifts in the structure and location of industrial production have taken place. For the world as a whole, when economic activity is grouped under three broad sectors – primary, industry and services[1] – the most startling change has been the rapid growth in the service sector, which increased its share in world gross domestic product (GDP) from 53 per cent in 1980 to 63 per cent in 1995. That growth has been at the expense of the shares of both the primary and industrial sectors: the share of the manufacturing sector in world GDP fell from 23 per cent in 1980 to 21 per cent in 1995. Nevertheless, for many developing countries the extractive industries still remain important.

7. Important patterns can be observed when these overall trends are disaggregated by major country groups. In countries, where trends have been much stronger, manufacturing value-added share of GDP has fallen to below

20 per cent in many large and medium-sized countries. On the other hand, in a large number of developing countries manufacturing value-added shares of GDP have been rising in the course of economic development, and that trend can be expected to continue. However, in many other developing countries where manufacturing activity has reached a relatively high share of GDP, growth in the service sector is exceeding that of the manufacturing sector and has resulted in a fall in the share of manufacturing value added as experienced by the developed countries.

8. As a result of the more rapid rate of growth of manufacturing in developing countries relative to the developed countries, the share of developing countries in world manufacturing value added has risen from 12.9 per cent in 1980 to 20.9 per cent in 1995, and is expected to reach about 25 per cent in 2000.[2] Some of the changes in regional shares of world GDP are due to the stimulus provided by trade liberalization and the increasingly globalized nature of world production. Nonetheless, concerns in some quarters of a wholesale displacement of manufacturing activity from developed to developing countries may be exaggerated. In fact, the share of manufactures imported from developing countries in the apparent consumption of manufactures of the EU, Japan, the United States of America and Canada was only 4.7 per cent in 1994, having increased from 2.5 per cent in 1980.[3] In some subsectors, of course, penetration of developed country markets has been large. For example, imports from developing countries in the apparent consumption of apparel of the EU, Japan, the United States and Canada increased from 13.7 per cent in 1980 to 35.3 per cent in 1994.[4] It remains true that developing countries continue to incur a deficit in their trade in manufactured goods with their developed country trading partners.

9. Considerable environmental pressures (air and water pollution, soil erosion and contamination, for example) are associated with some of the branches of industry mentioned above. The intensity of these environmental pressures can be expected to increase with higher per capita levels of production. For example, taking only the urban population in the more industrialized developing countries, estimates of per capita output and use in several industry branches, such as iron and steel, cement, and use of industrial chemicals, show that they are approaching levels similar to those in developed countries.[5] Thus, in the absence of more rapid introduction of environmentally sound technologies, populations in the urbanized areas of these developing countries could potentially be exposed to levels of industrial pollution as high as those to which citizens in developed countries were exposed not so very long ago.

10. An improved understanding of these trends and their projected evolution in the future can facilitate the design and implementation of better policies to achieve sustainable development by shedding light on some important questions. Is the world economy, for example, becoming more energy and material-intensive or less so? Are those branches of industry traditionally associated with a wide range of environmental and pollution problems (mining, pulp and paper, cement, iron and steel, energy and transport, chemical production and use) reducing their environmental impacts through improved policies or moving to countries with lower environmental standards? What are the social costs of industrialization, such as urbanization in developing countries? Can providers of business services, such as the banking and insurance industries, be an increasingly constructive force for change? Examining some of the more salient trends in economic structure in the past 15 years and assessing future trends might provide a useful background against which to consider such questions, and it will therefore be important to continue work in this area.

B. Economic policy challenges for government and industry

11. In order to achieve the objectives of sustainable development, both national Governments and industry face a number of major challenges. Governments need to integrate economic, social and environmental concerns in their policy development and to promote economic growth and international competitiveness of industry through macroeconomic and other policies. Furthermore, they need to implement policies that promote domestic entrepreneurship and help attract foreign direct investment (FDI) and technologies. Moreover, it is crucial to develop a national technology strategy. In addition, Governments need to undertake capacity-building to be able to promote partnerships with industry and enhance the dialogue with all major groups in society. Governments in both developed and developing countries need to continue their dialogue with industry on creating an enabling policy environment for industrial development.

12. In general, policy reforms for sustainable growth are necessary to provide the framework within which industrial development can take place in a manner that is conducive to both social development and environmental protection. For example, eco-efficient technologies can contribute to industrial competitiveness (by reducing production costs, and improving product quantity and quality), improve the social aspects of the working environment and sometimes

generate employment. Improved human resources can also contribute to improvements in productivity and provide the skills needed for environmental management.

13. A major policy area is the maintenance of a stable macroeconomic environment. In addition to macroeconomic reforms, countries should also pay attention to reforms at the meso-economic and microeconomic levels in order to improve the overall or systemic competitiveness of the economy. Although microeconomic policy reforms would operate at the level of the firm, meso-economic reforms would target the environment (factor markets and physical and institutional infrastructure) in which the firm operates. In order to promote competitiveness and productivity increases, due attention should be given to public investment in human capital and technology.

14. For developing countries and economies in transition, FDI is often an important source of capital, new technologies, organization and management methods and access to markets. Experience has shown that there are strong complementarities between domestic and foreign investment, including backward and forward linkages, that can be promoted, such as through the establishment of joint ventures and other arrangements. In order to attract and retain FDI, a stable policy environment is necessary to ensure confidence among both domestic entrepreneurs and foreign investors in the economy. Developing countries looking for technology inflows should also turn to FDI from other developing countries since such technology transfers may enable both parties to better exploit their regional comparative advantages through regional cooperation. Through technological progress, developing countries can expand their opportunities for employment creation in higher skill categories and support services. Firms in some of the more advanced developing countries have gained access to key technologies and other strategic assets by undertaking direct investments in industrialized countries.

15. A well developed skill and knowledge base is necessary for a successful domestic technology strategy and the absorption of imported technologies. Domestic technological capabilities should also be strengthened through greater cooperation between industry and domestic research and development activities. This may take the form, for example, of government support to stimulate productive links between the business and academic communities. Moreover, by promoting environmentally friendly technologies, economies can promote both technological upgrading and environmental sustainability at the same time.

16. In order to stimulate domestic private enterprise and boost economy-wide competitiveness, policy reforms should aim to create an enabling policy environment, *inter alia*, through improvements in infrastructure and education, encouragement of research and development, facilitation of exports and liberalization of domestic markets. Experience in a number of countries, such as the Republic of Korea and Malaysia, show that when reforms are undertaken to deregulate and liberalize markets, there are potentially positive benefits in the form of innovation, diffusion of technology and more efficient use of resources. In many developing countries and countries in transition, the development of small and medium-size enterprises (SMEs) is often hampered by inadequate financing and lack of industrial support services. Given the importance of the informal sector in many developing countries, it is crucial that policy reforms address this source of entrepreneurial potential.

17. Another major challenge for Governments is to ensure that their economic and industrial policies are gender neutral. For example, privatization policies can affect the economic status of women and men in different ways. In many developing countries and in the economies in transition, wage and employment conditions for women are better in the public sector, where the gender gap in wages is narrower than in the private sector. In addition, women in the public sector enjoy more fringe benefits and better access to social security than women employed elsewhere.

18. As active government involvement in production has declined, the role of the private sector has expanded, including in such areas as investment in human capital and technology development. As a result, effective sustainable development policies are increasingly the outcome of dialogue and partnerships between government, business and other major players in society, such as organizations of employers and workers.

C. Economic policy challenges for the international community

19. The challenges facing the international community with regard to industrial and economic development are daunting. There is an urgent need to deal with the issues raised by globalization and the related problems of international trade and investment. Although some developing countries have been able to take advantage of the opportunities created by the increased globalization of markets, most developing countries, in particular the least developed countries, have not been able to strengthen their industries through expanded trade and increased FDI to diversify their industries. Therefore, the international

community needs to focus its work on assisting developing countries in strengthening their ability to face competition in global markets to reap the benefits of the Uruguay Round of multilateral trade negotiations. In addition, it will be desirable to support regional trade arrangements and discuss issues related to investment-related international treaties.

20. The international community has an important role to play in helping developing countries and economies in transition to strengthen the ability of their manufacturing sectors to face competition in global markets. In particular, multilateral and bilateral assistance is needed to support the design of strategies and policies to foster international competitiveness, build domestic capacities and stimulate the development of individual industrial activities. Such international action to overcome the impediments to industrial development in Africa, for example, is exemplified by the United Nations System-wide Special Initiative for Africa. In addition, the regional commissions should be encouraged to review the various aspects of sustainable industrial development, taking into account the specific feature of the industrial development of their member States and the region as a whole.

21. The Uruguay Round agreements and the establishment of the World Trade Organization provide the promise of an expansion of international trade within a more open global environment. This development will significantly affect the pace of industrialization in developing countries, particularly countries that will derive improved access to developed country markets. However, most African and some Caribbean countries may suffer initial losses with the erosion of existing preference margins, and special consideration will need to be given to those countries to ensure that they do not bear the burden of adjustment to the new global trading system.

22. Within the global trading system, initiatives to extend regional integration and associations among developing countries, such as free trade areas or customs unions, can contribute significantly to export growth. The Association of Southeast Asian Nations (ASEAN) Free Trade Area and the Asia Pacific Economic Cooperation are good examples of successful regional economic arrangements in Asia. A number of European economies in transition have negotiated agreements with individual European countries and the EU, and those arrangements will present them with important opportunities to develop trade and investment ties. However, in those transitional economies the creation of a business climate that will encourage domestic producers to meet foreign competition remains a major challenge for policy makers.

23. Many developing countries rely on FDI as a source of technology and capital, and there is therefore need for the international community to promote a more conducive and stable environment for flows of investment. By the beginning of 1997, there were over 1,300 bilateral investment agreements, of which a growing number were treaties between developing countries. There has also been a proliferation of regional and other initiatives that address the establishment of international rules relating to foreign investment, including, for example, the North American Free Trade Agreement, the Energy Charter Treaty and the work of the Asia-Pacific Economic Cooperation Council on investment. In view of the proliferation of such investment-related treaties and initiatives, the effort of the Organisation for Economic Cooperation and Development (OECD) to negotiate a multilateral agreement on investment and a similar initiative by ASEAN are welcome.

III. Industry and social development

A. Role of industry in social progress

24. Social development goals are an integral part of the sustainable development strategies discussed in Section II above. The primary force driving economic development has been industrialization, which in turn has the potential for promoting, directly and indirectly, a variety of social objectives, such as employment creation, poverty alleviation, gender equality, and greater access to education and health care. There is a mutually reinforcing relationship between social and industrial development. In most cases, countries that have not been successful in promoting industrial development have not achieved sustained progress towards attaining social goals. On the other hand, countries that have not invested enough in social development, such as education and health care, tend to lack the basis for long-term competitiveness and profitability of industry.

25. One of the major contributions of industry to social development is the creation of productive employment. The change in industrial structure, as discussed in Section II above, had a significant impact on employment, particularly in developing countries. Indeed, between 1965 and 1990, the share of employment in the industrial sector in developing countries increased from 11 to 14 per cent. However, this picture masks the divergence of experience among developing countries. In general, although the newly industrializing Asian economies have experienced significant growth in the share of industrial employment, sub-Saharan Africa has seen only a minimal increase in such

employment. During the same period, in developed countries the share of employment in the industrial sector declined from 37 to 26 per cent, reflecting the sharp shift in employment from industry to the modern services sector. A consistent trend, that cuts across all countries, however, is that the services sector is an increasingly important source of employment.

26. Changes in the pattern of industrial employment in both developed and developing countries have been associated with variations in real wages and in the skill levels required in manufacturing. In the case of some low-income developing countries in South and South-East Asia, for instance, real wages have declined in the formal manufacturing sector. At the same time, in other developing countries with higher rates of employment creation in industry, real wages have tended to increase. In higher-income countries, average real wages have generally not fallen and there has tended to be labour saving technological changes in industry and employment reduction, especially for unskilled workers. As for middle-income countries, real wages have risen, but because they have begun diversifying their export capacity into new more technology-intensive product areas, they have found that fewer but more highly skilled workers are required.

27. The contribution that industry can make to the alleviation of poverty through employment creation has been amply demonstrated. Over the course of the last 20 years, some developing countries, particularly in East Asia, have been able to reduce the incidence of poverty (share of population subsisting on less than $1 per day) by a significant amount. In a number of countries, including China, Indonesia, the Republic of Korea and Malaysia, the incidence of poverty was reduced by 70 to 80 per cent. On the other hand, in sub-Saharan Africa, where industrialization has yet to establish itself, the number of poor people actually increased in the late 1980s and early 1990s.

28. Improved access to education and health care in developing countries has, in general, been associated with the pace of industrialization. In the rapidly growing developing countries in East Asia, for instance, industrial growth was either preceded or accompanied by expanding access to education, first through universal access to primary education, then by expanding access to secondary education. There have also been significant improvements in access to health care in developing countries over the past three decades, and on average about 80 per cent of the population now have access to health care. However, that picture conceals poor progress in some regions: in sub-Saharan countries, for example, only about half of the population have access to these services.

29. Industrial development and structural change have also contributed to an increase in the labour force participation of women in both developed and developing countries through an expansion of employment opportunities in general. In the industrialized countries, much of the increase in female employment has been in services, the fastest growing sector. In developing countries, on the other hand, manufacturing employment provided significant increases in job opportunities for women, particularly in developing countries that experienced rapid expansion in export-oriented manufacturing activities. While these gains from increased access to labour markets in developing countries are of great importance for enhancing gender equality, women in these countries still tend to receive a lower-than-average wage rate.

30. The above-mentioned positive social effects of industrialization go hand in hand with a number of negative ones. For example, industrial development, under certain political, social and economic conditions, can be associated with negative effects, such as the exploitation of child and bonded labour, deterioration in working conditions, job insecurity, informalization of employment and a weakening of trade unions. Furthermore, intense competition caused by increasing globalization can make corporations cut back expenditures on social protection or dilute their contractual obligations to their workforce. It is, however, unclear whether increasing globalization per se actually contributes to these conditions. At the national level, industrial production by SMEs in the informal sector can also have significant negative impacts upon the achievement of social objectives. In the absence of adequate regulation and oversight of manufacturing and employment practices, such enterprises can harbour unsafe working conditions, abuse of worker rights, exploitation of female and child labour, and lack of social protection. Such negative outcomes are by no means limited to developing countries, as demonstrated by the development of "third world" labour conditions and small "sweatshops" employing vulnerable groups, among which a disproportionate number are women, in industrialized countries.

31. In dealing with the problems of industrialization, social policy has not always been gender neutral. Women usually receive less education and training than men, especially in developing countries, and can face declining employment opportunities. This may have negative impacts, *inter alia*, on poverty reduction, since it is well known than women constitute the majority among the poorest of the population

and their economic development is crucial for raising their well-being.

B. Social policy challenges for government and industry

32. The overriding policy challenge for government and industry is to promote the positive impacts while limiting or eliminating the negative impacts of industrial activities on social development. As far as Governments are concerned, the major policy challenges that they face are to develop human resources, alleviate poverty, improve social security, reduce gender disparities and protect core labour standards (freedom of association, collective bargaining, elimination of child labour exploitation and elimination of gender discrimination). To that end, Governments need to expand and intensify cooperation with industry, trade unions and other groups of civil society. The major challenge facing industry is to contribute to social development objectives through greater compliance with core labour standards, more corporate social initiatives, attention to human resource development and worker welfare. To a large extent, such challenges facing industry can be best addressed through better dialogue with trade unions and Governments, particularly in support of the Government's efforts through an expansion of voluntary initiatives.

33. In order to promote human development through improved access to education, Governments in developing countries should give priority to ensuring universal access to basic education and expanding access to secondary education. Industry and civil society should work with Governments to strengthen secondary, vocational and advanced education and ensure that they meet the developmental needs of society and the economy. Governments and civil society should also address the problem of rapidly expanding labour forces, especially youth labour, by expanding reproductive health/family planning services where unmet needs exist.

34. Employment creation plays a pivotal role in the alleviation of poverty and government efforts to stimulate employment growth must encompass both the formal and informal sectors. Since the informal sector is an important source of employment in developing countries, Governments should ensure that the policy and regulatory environment supports SMEs by removing barriers to market access. Bureaucratic obstacles to formalization should be reduced and access to information, training and credit should be facilitated. Industrial development policies should include efforts to facilitate and promote linkages between informal and formal sector enterprises, including, where relevant, TNCs. With regard to trade-related employment policies, Governments should endeavour to ensure that the benefits from international trade and trade agreements are widely shared. Adjustment assistance to communities and retraining programmes for workers are required to optimize the net employment creation potential of trade liberalization.

35. There is increasing concern about the limited coverage of existing social security programmes in developing countries and about the deteriorating quality of employment. To deal with these problems, Governments should cooperate with industry, trade unions and other concerned organizations of civil society in expanding, strengthening and ensuring the sustainability of social security arrangements. Furthermore, since employment-based arrangements with contributions from employers and employees are a central component of social security systems in most countries, Governments should ensure that the benefits of such systems are secure and portable between employers. Moreover, Governments, in cooperation with industry, should ensure that social security coverage is as broad as possible and where feasible based on mandatory worker and employer participation. With regard to the quality of employment, increased efforts are needed by Governments, in cooperation with industry and civil society, to ensure universal compliance by industry of core labour standards. The lessons and examples of good practices by industry should be disseminated, and incentives to encourage better working conditions should be provided. At the same time, there should be efforts to extend the protection of core labour standards to informal enterprises as well.

36. In view of persistent gender disparities in such areas as income, employment, education and health, Governments, industry, trade unions and other organizations of civil society, in particular women's organizations, should work together towards the elimination of discrimination against women in employment, education, property ownership and access to credit, and to ensure that women have effective equal access to economic opportunities and social participation.

37. Governments should encourage the wider dispersion of voluntary initiatives on the part of industry in both the formal and informal sectors. To a large extent, these voluntary initiatives reflect a change in the way in which business perceives its social responsibilities. The "corporate responsibility" movement is already making strong headway in corporate headquarters in OECD countries, where firms are finding that by providing better health and safety conditions, shorter working hours and more consultative

forms of management, they can improve the economic performance of their companies in many dimensions.

38. Companies are also re-evaluating the concept of corporate ethics, and such issues as combating corruption are becoming part of company business principles and have been part of international negotiations. A number of corporations in developed countries have also included human rights in their business principles and codes of ethics. However, in general, businesses should not be expected to perform tasks that other parts of society have been unable to deal with. It is therefore necessary to understand what companies must do (comply with laws and ensure safe working conditions), what they may do (invest in community projects, develop employee training programmes, promote the use of local personnel for technical and managerial jobs and contribute to public debate) and what they cannot do (interfere with political and legal processes). Monitoring and enforcement are called for in the first case, enabling frameworks and partnership schemes are necessary in the second, and a clear understanding of the limitations and boundaries of action is required in the third.

C. Social policy challenges for the international community

39. Among the central concerns of the international community should be the growing international income disparities and the risk that some countries and groups might fall deeper into poverty and exclusion. The World Summit for Social Development has provided perhaps the strongest basis for international cooperation in this regard. Policies should build on countries' commitments expressed in the Copenhagen Declaration on Social Development, which includes the expansion of productive employment and the reduction of unemployment for those able to work, as well as the enhancement of social protection and reduction of the vulnerability of the poorest groups.

40. Concerted action for implementation of the 20:20 Initiative will make a significant contribution to social development, particularly among the poorer developing countries. The 20:20 Initiative, endorsed by the World Summit for Social Development and reaffirmed in the Oslo Consensus in 1996, calls for Governments and aid donors to allocate 20 per cent of their budgets to basic social services.

41. The international community should continue to encourage the observance of core labour standards and other standards related to working conditions. Technical assistance by international agencies is required to help firms in low-income countries, as well as small enterprises in all regions, to attain the required standards without undercutting their competitive position in the global economy.

42. Finally, the follow-up to the Fourth World Conference on Women will be of great importance. The Conference reaffirmed the advances made at the United Nations Conference on Environment and Development, and emphasized the need to mainstream a gender perspective into the development agenda. The discussion of gender must permeate the discussion on the relationship between industry and sustainable development, and must be one of the criteria used to evaluate policy formulation and for standard-setting at both the national and international levels.

IV. Industry and environmental protection

A. Impact of industry on the environment

43. As the role of industry in economic development has expanded, there has been a corresponding increase in the impact of industrial activities on the environment. Harmful emissions and waste are generated by all industry sectors, and can have global, regional or local impacts. At the local level, industrial emissions contribute to urban air pollution and the contamination of soils and rivers. Impacts at the regional level include acid rain, water contamination and coastal zone contamination. The main global impacts are climate change, ozone layer depletion and the loss of biodiversity.

44. Given the current global distribution of industrial production (see sect. II above), the bulk of industry-related global environmental problems emanate from industrialized countries. For example, the developed countries and economies in transition in 1994 accounted for about 64 per cent of global carbon dioxide emissions from industrial activity, and had per capita emissions roughly 6.5 times that in developing countries.[6] However, with further industrial development in developing countries and economies in transition, environmental pressures associated with industrial processes increasingly pose risks to ecosystems and human health at the national level, as mentioned in section II above.

45. More recently, concerns about the sustainability of current industrial development patterns and the trade-off between economic growth and environmental protection have been moderated by a more optimistic view that environmental sustainability and industrial development

need not always be at odds with one another. In particular, given appropriate technology, institutions, policies and systems of incentives, industrial development and environmental protection can to some extent be complementary objectives. Coping with the environmental impacts of industry poses important policy challenges to the international community, Governments and industry.

B. Environmental policy challenges for government and industry

46. The overriding task facing Governments is to maximize the positive influence of industrial activities on economic and social development while minimizing the impact of the production and consumption of manufactured goods on the natural environment. Therefore, Governments will need to address the further integration of environmental and industrial policies, with emphasis on the preventive approach in their environmental policies. To that end, Governments will need to review their regulatory policies and systems of economic incentives and disincentives. There is also a need for Governments to undertake other action, such as capacity-building and environmental data collection that support the environmental protection efforts of industry and civil society. Industry, for its part, faces the challenges of reorienting corporate philosophy, practice and ethics in order to promote sustainable development, particularly through better environmental management and by establishing closer partnerships with government and civil society.

47. Governments need to adopt an integrated policy approach and regulatory framework that sets clear environmental goals and objectives for business and industry. This requires the development of strategic environmental policies at the national and subnational levels to ensure an integrated approach that includes the setting of environmental goals and objectives, the implementation of regulations and market incentives/restrictions, the monitoring of policies and corrective action. The environmental performance in industry can be improved by a judicious mix of instruments, including incentives as well as direct regulation, that facilitate innovation and complement economic policies. Most countries still rely heavily on the traditional methods of command and control based on emission and effluent standards, penalties and fines. Those methods need to be supplemented by economic instruments, such as taxes and pollution charges and the elimination of subsidies for resource use, which can lead to better resource management and sustainable development because they provide incentives for pollution control and the internalization of environmental costs. The use of emission trading schemes as an alternative to other economic instruments has received increasing attention and should be further explored. However, such schemes may have limited applicability in developing countries because viable markets for tradable emission permits are not easily established.

48. With regard to the setting of environmental goals, the discussion on factor 4 and factor 10 has added a new dimension to the ongoing debate by establishing targets for material and energy efficiency improvements to be achieved within set time-frames in developed countries.[7] The recommended target is that factor 4 is to be achieved between 2020 to 2030 and factor 10 by 2050. Many experts believe that current production technology is capable of achieving improvements of the order of at least factor 4 by the year 2020-2030. These or similar efforts may be necessary to achieve the greenhouse gas emission reduction targets agreed upon at Kyoto. Otherwise, a disproportionate burden would fall on progress in decarbonizing energy. Such issues will be considered by the Commission in 2001, when energy and transport will be on its agenda.

49. Governments can promote the shift to eco-efficient industries through a variety of national measures. For example, green procurement policies and eco-labelling programmes may enlarge the market for greener products. Monitoring the environmental performance of industry is an ongoing challenge in most countries, in particular as budgets for enforcement programmes are declining. This ultimately requires the development of national indicators with which to benchmark the effectiveness of national environmental policy plans and indicators with which to measure industry environmental performance. Alternative national accounts that measure the total use of natural resources is one example of such needed indicators. In addition, regular assessments of emissions and the implementation of policies are required to guide rational and effective decision-making for environmental policy formulation, implementation and evaluation.

50. Although government regulations have directed industry's initial response to environmental issues, there is now a growing trend among a variety of stakeholders to hold companies accountable and responsible for the environmental impacts of their operations and products throughout their entire life cycle. Industry, primarily through industry associations, has responded to these growing demands by developing voluntary codes of conduct, charters and codes of good practice. Agenda 21 endorsed this voluntary approach, and encouraged business and industry to use such codes to promote best environmental practice.

51. A major challenge for industry is to improve its access to appropriate information, expertise and know-how to improve its environmental performance. In order for environmental management standards to be most effective, Governments must be aware of their role in ensuring that the proper infrastructure for successful operation of these standards is in place. Several countries are taking a proactive approach to establishing an environmental management system (EMS), and are promoting their implementation at the national level through the development of national standards based on ISO 14000 or the European Management and Audit Schemes (EMAS) and by providing training and incentives to businesses, particularly SMEs, which choose to implement an EMS. Governments and industry must work together to develop policies to ensure that conformance with standards is not too costly or difficult to achieve for companies in developing countries or SMEs. In particular, due consideration should be given to the relevance of EMS for SMEs, which do not have basic management systems in place, as well as the need for third-party certification, which may be costly for them. Reasonable training and certification costs and the creation of a scheme for multilateral recognition of certification are necessary to ensure that such standards do not act as non-tariff trade barriers.

52. As far as policy challenges with regard to subsectors of industry are concerned, each of these subsectors faces a specific set of key environmental issues and has therefore responded in different ways. For example, the chemical industry was one of the earliest subsectors to devote its efforts to environmental stewardship. It developed an industry-wide code, entitled "Responsible care", to promote broad-based performance improvement, reduction of risk and establishment of best management practice. In addition to "Responsible care", the various national and regional chemical associations have also developed and implemented programmes of their own.

53. In the case of the iron and steel subsector, it is important to note that both demand for and production of steel is rising, particularly in developing countries. To promote best practice in environmental management, a policy guideline was adopted by the International Iron and Steel Institute, whose members represent 70 per cent of world production. One of the unique features of the steel industry is the open exchange of technology. As a result, some of the most efficient and cleanest steel-making plants are located in developing countries. A major challenge, however, is the need to upgrade performance in the former centralized planned economies since it is in those countries that the worst performance can be seen today.

54. Alongside steel, cement is an essential input to all construction programmes. The two most important environmental issues for this sector are energy use and emissions to the atmosphere. The development of programmes for energy efficiency and alternative energy sources are key challenges for the cement industry. Regarding the latter, programmes using wastes as energy sources have allowed enterprises in this sector not only to better their own performance but also to help other sectors to solve their own problems by providing them with a means for safe disposal of wastes. Technological developments have also strongly reduced atmospheric emissions from the cement sector. However, much of the progress has so far been concentrated in the OECD countries and should be extended to all countries.

55. With regard to the paper and pulp subsector, corporate initiatives have also been encouraging. In Canada, for example, the joint industry-government accelerated reduction/elimination of toxic substances programme is a voluntary commitment by pulp and paper producers to cut overall toxic air and water emissions by 44 per cent from 1988 levels. There are plans to cut emissions by a further 51 per cent by the year 2000. Moreover, there have been successful corporate initiatives in many countries to extend recycling. Since the early 1970s, leading pulp and paper mills have reduced their environmental impacts, such as by recycling effluent water to achieve close-cycle bleaching and using substitutes for chlorine gas in their bleaching process. However, the major challenge for this industry is to develop best practice in the forest sector.

56. With respect to the mining industry, industry initiatives have become more visible. At the international level, the International Council on Metals and the Environment has an environmental charter that sets product and environmental stewardship as goals for the industry. There have also been important industry initiatives at the national level. For instance, the experience of Canada with the Mine Environment Neutral Drainage programme to reduce acid mine drainage and the Whitehorse Mining Initiative Accord, which provided a strategic vision for the mining industry, has illustrated valuable avenues for cooperation between industry, government and civil society. Given the global presence of mining activities and their potential environmental impacts, the major challenges for this industry are therefore to promote best practices and renewal of mining areas, as well as to pursue greater cooperative efforts with Governments and civil society to protect the habitat and livelihood of indigenous people.

57. Such subsectors as banking and insurance can make an indirect contribution to sustainable development by virtue

of the influence they have on all industry sectors. First, banks are making efforts to include environmental risk assessment to credit procedures, while insurance companies are evaluating environmental performance in their determination of premium levels. Second, with respect to investment banks are promoting a greater recognition of environmental investment opportunities. More recently, investment funds and banks have begun to evaluate companies on a range of non-financial criteria, including environmental performance.

58. Although voluntary initiatives of all subsectors of industry have been a valuable tool in protecting the environment, some stakeholders and government officials still remain sceptical of the extent of their contribution. Effective monitoring and follow-up programmes are key factors for demonstrating that such codes of conduct have amounted to anything more than merely words on paper. The increasing number of corporate environmental reports have been a positive contribution, especially when they include specific goals and an evaluation of progress made by the companies in reaching these goals, or have an element of third-party verification. In addition, in order to facilitate the assessment of progress made throughout a sector or country a common set of indicators and metrics will need to be developed to allow for comparability and aggregation of data.

C. Environmental policy challenges for the international community

59. The international community must deal with pollution problems that have transboundary and global impacts, and must support the efforts of developing countries to improve environmental sustainability at the national level. In particular, policy coordination at the international level is needed to address global environmental problems, issues related to the trade of hazardous wastes, and possible negative impacts of eco-labelling schemes and EMS on trade. International, regional and multilateral environmental agreements to mitigate global environmental problems need to be effectively translated into practical programmes for implementation by industry. Of particular importance to business and industry are the Montreal Protocol on Substances that Deplete the Ozone Layer, the United Nations Framework Convention on Climate Change (including the recent Kyoto Protocol), the Convention on Biological Diversity, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, the Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution and the recommendations of the Intergovernmental Forum on Forests.

60. The potential boost for world manufacturing from liberalization of world trade raises fresh concerns about the global linkages between economic growth and environmental sustainability. Much depends on whether the changes in trade levels will generate outcomes that will enhance or harm the environment. This presents a major challenge for the international community to help developing countries to progressively raise environmental standards, and to facilitate their adoption of production technologies that reduce environmental pressures while at the same time allowing them to be competitive in international markets. In addition, the international community should further address the issue of improved surveillance of trade in hazardous wastes. Such wastes have been shipped routinely, although usually illegally, in spite of the Basel Convention, from industrialized to low-wage countries for disposal or recycling. The fourth Conference of Parties to the Basel Convention, scheduled for 23 to 27 February 1998, is expected to decide which wastes will be covered by a ban on exports of hazardous wastes from OECD to non-OECD countries. More emphasis should perhaps be given in future to risk management for those hazardous wastes not subject to an outright ban.

61. There is a need to widely disseminate information about eco-efficient technologies and management tools to Governments and industry. A number of international programmes have been set up to increase worldwide awareness of the preventive environmental protection strategy embodied in cleaner eco-efficient production, and to help government and industry develop programmes and activities that will expand the adoption of cleaner production know-how and management approaches. There may also be a need to reach international agreement on environmental standards for pollution-intensive industries in which competitiveness issues hamper approaches at the national level, especially in developing countries.

62. Increasing international concerns about the risks of using hazardous chemicals has led to the establishment of the International Code of Conduct on the Distribution and Use of Pesticides, and the London Guidelines for the Exchange of Information on Chemicals in International Trade, which address this issue. In 1989, a procedure to help control the import of unwanted chemicals was added under the name of prior informed consent; at a final negotiating session provisionally scheduled for March 1998, that procedure may be made mandatory in international trade in certain dangerous chemicals and pesticides. An active

participation by all Governments in such programmes is necessary in order to ensure that full benefits are achieved.

63. International attention has also been focused on the issue of persistent organic pollutants (POPs) – chemical substances that persist in the environment and bioaccumulate through the food web, possibly posing a risk to the environment and adverse effects to human health. Recently, evidence of long-range transport of these substances has led to an international negotiation to reduce and eliminate their release. The Intergovernmental Forum on Chemical Safety has found sufficient scientific evidence to demonstrate the need for international action on 12 specified POPs. That process has been a good example that cooperation between Governments, specialized United Nations agencies and industry can achieve solutions. All groups involved should endeavour to finalize the work in these negotiations so that effective procedures can be established. It is notable that the Economic Commission for Europe protocol on POPs is expected to be finalized in June 1998.

64. There is a need for international conventions on the environment to include information "clearing house" functions with the aim of providing practical advice and know-how to industry in order that they meet the obligations set out in the conventions.

65. With regard to international agreements on investment, consideration should be given to if and how environmental objectives may be addressed.

66. Finally, the international community will also have to strengthen development cooperation to make industrial development more environmentally sustainable, concerning which financial support and measures to accelerate the transfer of environmentally sound technology will be of prime importance.

Notes

[1] The primary sector includes agriculture, forestry and fishing; the industrial sector comprises mining and quarrying, manufacturing, utilities and construction; the services sector includes banking and insurance, wholesale and retail trade, real estate, other business services, restaurants and hotels, travel, education, health and government services.

[2] Taken from United Nations Industrial Development Organization, *International Yearbook of Industrial Statistics* (Vienna, 1997); figures include China.

[3] Apparent consumption refers to gross domestic output less exports plus imports.

[4] Computed from UNCTAD, *Handbook of International Trade and Development Statistics* (Geneva, 1995).

[5] Estimates by the Division for Sustainable Development of the United Nations Secretariat.

[6] Per capita ratios derived from data in *World Economic and Social Survey, 1997* (United Nations publication, Sales No. E.97.II.C.1), p. 201.

[7] Factor four refers to the potential to quadruple global resource productivity by halving resource use and doubling productive capacity. See von Weizsäcker, Lovins and Hunter, *Factor Four: Doubling Wealth, Halving Resource Use* (London, Earthscan Publications, 1997).